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destroying both sensibility and the power of voluntary motion, particularly as exemplified in the hybernation of animals, to its mechanical operation of diminishing the fluidity, or producing solidity, in the oily medium by which these powers are exercised.

2. A letter from Prof. Hanson to G. B. Airy, Esq., F.R.S., A.R., was also read, "On a New Method of computing the Perturbations of the Planets whose eccentricities and inclinations are not small." Communicated by G. B. Airy, Esq., F.R.S.

The author announces that he has found a method by which the absolute perturbations of planets for any given time, with any given eccentricity and inclination of the orbit, may be calculated; and he exemplifies his method by applying it to the computation of the perturbations produced by Saturn on the comet of Encke, in every point of its orbit; a problem of which hitherto there existed no solution.

3. A paper was also in part read, entitled "On the minute structure of the Skeletons or hard parts of the Invertebrata." By W. B. Carpenter, M.D. Communicated by the President.

January 19, 1843.

GEORGE RENNIE, Esq., V.P., in the Chair.

John Gould, Esq., Sir Benjamin Heywood, Bart., and Edward Solly, jun., Esq., were balloted for and duly elected Fellows of the Society.

Captain Edward Belcher, R.N., was balloted for, but not elected a Fellow of the Society.

The following papers were read:—

1. "Variation de la Déclinaison et Intensité Horizontale observées à Milan pendant vingt-quatre heures consécutives le 25 et 26 Novembre, et le 21 et 22 Décembre 1842." Par Prof. Carlini, For. Mem. R.S.

2. The reading of a paper, entitled "On the minute structure of the Skeletons or hard parts of Invertebrata," by W. B. Carpenter, M.D., was resumed and concluded.

The present memoir is the first of a series which the author intends to communicate to the Society, and relates only to the Mollusca; and he proposes, hereafter, to extend his inquiries to the skeletons of the Echinodermata, and the various classes of articulated animals. After adverting to the classifications of shells proposed by Mr. Hatcher and Mr. Gray, from the propriety of which he finds reason to dissent, he proceeds to state the results of his microscopic examination of the texture of shells under the several following heads. First, shells having a prismatic cellular structure,

as the Pinna, and which are composed of a multitude of flattened hexagonal calcareous prisms, originally deposited in continuous layers of hexagonal cells, and thus constituting a calcified epithelium, analogous with the enamel of the teeth. Secondly, those consisting of membranous shell-substance, the basis of which, after the removal of its calcareous portion, presents nothing but a membranous film, of greater or less consistence, composed of several layers, but without the appearance of any cellular tissue: this membrane the author regards as being derived from the mantle, of which it was originally a constituent part, by the development of nucleolated cells; and the various corrugations and foldings of which it is susceptible in different species, introducing many diversities into the structure of the shells of this class. Thirdly, shells having a nacreous structure, and exhibiting the phenomena of iridescence; a property which the author ascribes to the plicated form of the membrane of the shell, combined with a secondary series of transverse corrugations. Fourthly, shells exhibiting a tubular structure, formed by cylindrical perforations occurring among the several layers, and varying in diameter from about the 20,000th to the 3500th part of an inch; but measuring on an average about the 6000th part of an inch, and presenting a striking analogy with the dentine or ivory of the teeth. The last sections of the paper relate to the epidermis and the colouring matter of shells.

References are made, in many parts of the paper, to illustrative drawings; which, however, the author has not yet supplied.

January 26, 1843.

Sir JOHN WILLIAM LUBBOCK, Bart., V.P. and Treasurer,
in the Chair.

The following papers were read, viz.:—

1. "Observations on certain cases of Elliptic Polarization of Light by Reflection," by the Rev. Baden Powell, M.A., F.R.S., Savilian Professor of Geometry in the University of Oxford.

The author, by way of introduction, passes in review the labours of various inquirers on the subject of the elliptic polarization of light, and notices more particularly those of Sir David Brewster, who first discovered this curious property, as recorded in the *Philosophical Transactions* for 1830; of Mr. Airy, in the *Cambridge Transactions* for 1831 and 1832; and of Professor Lloyd, in the *Philosophical Transactions* for 1840, and in the *Reports of the British Association* for 1841. He then proceeds to give an account of his own experimental examination of the phenomena of elliptic polarization in the reflection of light from various surfaces, by observing the modifications of the polarized rings under different conditions, both of surface and of incidence, and by endeavouring to ascertain both the existence and amount of ellipticity, as shown by